Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

All claims currently being amended are shown with deleted text struckthrough or double bracketed and new text underlined. Additionally, the status of each claim is indicated in parenthetical expression following the claim number.

Claim 1 is being amended.

Please add claims 2-16 as indicated below.

WHAT IS CLAIMED IS:

Claim 1 (Currently amended) An apparatus for ~~cancelling~~ canceling far endpoint echo signals in audio signals transmitted from a near endpoint to a far endpoint, the apparatus comprising:

a near endpoint analysis filter bank operable to divide a near endpoint signal into a plurality of near endpoint subband signals, wherein the near endpoint analysis filter bank estimates power in the plurality of near endpoint subband signals;

a far endpoint analysis filter bank operable to divide a far endpoint signal into a plurality of far endpoint subband signals, wherein the far endpoint analysis filter bank estimates power in the plurality of far endpoint subband signals;

a background signal power estimator operable to ~~determine~~ estimate a background noise ~~at the near-end~~; and

logic for determining whether the estimated power in the plurality of far and near endpoint subband signals exceeds the background noise by a predefined threshold;

wherein if the estimated power in the plurality of far and near endpoint subband signals exceeds the background noise by the predefined threshold, then a counter is set to allow a speech activity indicator to hangover for a period of time.

Claim 2 (New)   The apparatus as recited in claim 1, wherein the counter is set to one of a plurality of counter values depending on which of a plurality of thresholds the estimated power in the plurality of far and near endpoint subband signal exceeds.

Claim 3 (New)   The apparatus as recited in claim 1, wherein the near end analysis filter bank divides a microphone input signal into the plurality of near endpoint subband signals.

Claim 4 (New)   The apparatus as recited in claim 3, wherein the far end analysis filter bank divides a speaker output signal into the plurality of far endpoint subband signals.

Claim 5 (New)   The apparatus as recited in claim 4, wherein short term speech activity in the microphone input signal and in the speaker output signal is detected by comparing a current short term power against a long term background noise power.

Claim 6 (New)   The apparatus as recited in claim 1, wherein the near endpoint analysis filter bank employs a plurality of filters, wherein a number of the plurality of filters is equal to a number of a plurality of subband signals inputted to the near endpoint analysis filter bank.

Claim 7 (New)   The apparatus as recited in claim 1, wherein the near endpoint analysis filter bank employs a single filter repeatedly used for each of a plurality of subband signals inputted to the near endpoint analysis filter bank.

Claim 8 (New)   The apparatus as recited in claim 1, wherein the far endpoint analysis filter bank employs a plurality of filters, wherein a number of the plurality of filters is equal to a number of a plurality of subband signals inputted to the far endpoint analysis filter bank.

Claim 9 (New) The apparatus as recited in claim 1, wherein the far endpoint analysis filter bank employs a single filter repeatedly used for each of a plurality of subband signals inputted to the far endpoint analysis filter bank.

Claim 10 (New) The apparatus as recited in claim 1, wherein the near endpoint analysis filter bank and the far endpoint analysis filter bank are polyphase filters.

Claim 11 (New) The apparatus as recited in claim 1, wherein the far endpoint analysis filter outputs a speaker subband power signal, a speaker full power signal and an echo signal power signal.

Claim 12 (New) The apparatus as recited in claim 11, wherein the speaker power signal, the speaker full power signal and the echo signal power signal are inputted to an adaptive filter, wherein the adaptive filter estimates echo cancellation power subband signals.

Claim 13 (New) The apparatus as recited in claim 12, wherein the echo cancellation power subband signals are subtracted from microphone signals before being inputted to a synthesis filter.

Claim 14 (New) The apparatus as recited in claim 13, wherein the synthesis filter performs an inverse operation of the near endpoint analysis filter bank and the far endpoint analysis filter bank.

Claim 15 (New) A method for canceling far endpoint echo signals in audio signals transmitted from a near endpoint to a far endpoint comprising the steps of:

dividing a microphone input signal into a first plurality of subband signals;

dividing a speaker output signal into a second plurality of subband signals;

estimating power in said first plurality and in said second plurality of subband signals;

estimating a background noise; and

determining whether the estimated power in the first and second plurality of subband signals exceeds the background noise by a predefined threshold;

wherein if the estimated power in the first and second plurality of subband signals exceeds the background noise by the predefined threshold, then a counter is set to allow a speech activity indicator to hangover for a period of time.

Claim 16 (New)   A computer program product embodied in a machine readable medium for canceling far endpoint echo signals in audio signals transmitted from a near endpoint to a far endpoint comprising the programming steps of:

dividing a microphone input signal into a first plurality of subband signals;

dividing a speaker output signal into a second plurality of subband signals;

estimating power in said first plurality and in said second plurality of subband signals;

estimating a background noise; and

determining whether the estimated power in the first and second plurality of subband signals exceeds the background noise by a predefined threshold;

wherein if the estimated power in the first and second plurality of subband signals exceeds the background noise by the predefined threshold, then a counter is set to allow a speech activity indicator to hangover for a period of time.